



**CONESTOGA-ROVERS  
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April 20, 2012

Reference No. 056394-06

Ms. Sheila Desai  
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77 West Jackson Boulevard (SR - 6J)  
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US EPA RECORDS CENTER REGION 5



489273

Dear Ms. Desai:

Re: Responses to U.S. EPA Comments  
Human Health and Ecological Risk Assessments  
Former Plainwell, Inc Mill Property Operable Unit No. 7  
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site  
Allegan and Kalamazoo County

Conestoga-Rovers & Associates (CRA) has prepared this letter, on behalf of the Weyerhaeuser Company (Weyerhaeuser), in response to the November 23, 2011 United States Environmental Protection Agency's (U.S. EPA's) comments on the Human Health Risk Assessment (HHRA) and Screening Level Ecological Assessment (SLERA) portions of the Remedial Investigation (RI) Report for the former Plainwell, Inc. Mill Property (Site), which was submitted to the U.S. EPA Region 5 on June 20, 2011. The RI Report was submitted in accordance with the RI/Feasibility Study (FS) Work Plan dated July 2009, the Multi-Area Field Sampling Plan dated November 2009, the Phase II RI Work Plan dated November 2009, the Statement of Work (SOW) for the RI/FS, and the terms of the Consent Decree for the Design and Implementation of Certain Response Actions at Operable Unit #4 and the Plainwell, Inc Mill Property of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (Consent Decree), which became effective February 22, 2005. Additionally, this letter has been prepared in response to the U.S. EPA's comments on a subsequent memorandum, entitled *Proposed Modifications to Human Health and Ecological Risk Assessments, Remedial Investigation Report, Former Plainwell, Inc. Mill Property, Plainwell, Michigan*, which was submitted to U.S. EPA on November 9, 2011.

The HHRA and SLERA presented in the June 20, 2011 RI Report were conducted based on the separation of the Site into three areas (Area 1, Area 2, and Area 3), consistent with the approach applied in the Site characterization. Since submission of the RI Report and based on comments provided on the HHRA and SLERA, the redevelopment areas of the Site have been refined, as shown on Figure 1.2 of the RI Report. The 11 redevelopment areas are identified as follows:

Equal  
Employment Opportunity  
Employer



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- Residential Areas 1, 2, 3, and 4
- Commercial Areas 1, 2, 3, and 4
- Mixed Residential/Commercial Areas 1 and 2
- Waterfront Plaza

The following presents responses to the U.S. EPA's comments consistent with the revisions to the RI Report dated April 20, 2012.

### **BASELINE HUMAN HEALTH RISK ASSESSMENT**

#### **U.S. EPA General Comment #1**

*The HHRA generally follows the approved work plan and relevant EPA and state risk assessment guidance. Several issues must be addressed before the HHRA can be approved, and these are described in the specific comments.*

#### **Response**

The comment is acknowledged. Please refer to the responses to the specific comments for details on how the comments have been addressed in the revised RI Report.

#### **U.S. EPA General Comment #2**

*Section 8.1.2.3 (page 159) states "The analytical results for samples collected from soil and groundwater are summarized and discussed in Sections 2.0 and 5.0." It is not clear from this single statement whether both pre-remedial investigation (RI) and RI data were considered quantitatively in the HHRA. The HHRA should be revised to clearly state which analytical data were used as part of the quantitative risk assessment calculations. Also, the HHRA does not specifically state that the data considered quantitatively in the risk assessment were evaluated in accordance with EPA's "Guidance for Data Usability in Risk Assessment (Part A) Final" (EPA 1992). This is especially important if pre-RI and RI data were combined for the purposes of quantitative HHRA calculations. Therefore, the HHRA should be revised to state and document that all of the analytical data used to prepare quantitative risk assessment calculations were evaluated in accordance with the above-referenced EPA guidance, and that it was appropriate to combine the pre-RI and RI data for use in the quantitative risk assessment.*



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#### Response

The comment regarding usability of Pre-RI data is also provided in the U.S. EPA's comments on the RI Report dated June 20, 2012. Please refer to the responses to the U.S. EPA's comments.

#### U.S. EPA General Comment #3

*The HHRA is based on the conceptual mill redevelopment plan (Figure 8.1; modified as Figure 1 in the memorandum). If this plan changes and the Site is redeveloped in a different fashion, the results of the HHRA may no longer be valid and may have to be redetermined.*

#### Response

Acknowledged. If the development plan changes significantly in the future, the HHRA and SLERA will need to be re-evaluated at that time to ensure that the Site remains protective of all potential users. The text of the HHRA has been revised to reflect this statement.

#### U.S. EPA General Comment #4

*Current land use scenarios were evaluated assuming exposure to surface soil. Future land use scenarios were evaluated assuming exposure to soil (defined for the HHRA as combined surface and subsurface soil). However, potential future exposures could also be to surface soil only. For example, buildings may be constructed using slab-on-grade construction. Also, construction of the recreational path planned for along the river may not require extensive intrusive activity. Potential recreational users would be better evaluated assuming exposure to surface soil. Therefore, the HHRA should be revised to add evaluation of future land use scenarios involving nonintrusive activity (residents, recreational users, and commercial-industrial workers), assuming exposure to surface soil only. The existing evaluation of future land use scenarios involving these receptors, assuming exposure to soil, should be retained.*

#### Response

The HHRA has been updated to include evaluation of future residents, recreational users, and industrial/commercial worker exposure to surface soil. The existing evaluation of future residents, recreational users, and industrial/commercial worker exposure to combined surface and subsurface soil has been retained.



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To differentiate the two exposure pathways, the exposure to surface soil only has been evaluated as an "undisturbed" scenario and the exposure to combined surface and subsurface soil has been evaluated as a "disturbed" scenario.

#### **U.S. EPA General Comment #5**

*The HHRA does not consider multiple receptor-specific exposures by a single individual. For example, a Site resident may also be a recreational user. Similarly, a Site worker may live at the Site or may also be a recreational user. The HHRA should be revised to identify, discuss, and present calculations for potential cumulative exposures, hazards, and risks for a series of reasonable exposure scenario combinations (including, but not necessarily limited to those discussed above).*

#### **Response**

For Residential Areas 1 to 4 and Mixed Residential/Commercial Areas 1 and 2, a resident was evaluated assuming that they are present within these areas or a period of 350 days per year (7 days per week for 50 weeks per year). Although the resident could also be a recreational visitor for the remainder of the year (2 weeks per year), it would be overly conservative and unrealistic to assume that the resident would never leave the Site over the course of the year. Furthermore, the resident is always considered to be the most sensitive receptor, and any measures required within Residential Areas 1 to 4 and Mixed Residential/Commercial Areas 1 and 2 would be based on the protection of residents.

For Commercial Areas 1 to 4 and the Waterfront Plaza, a commercial worker was evaluated assuming that they are present within these areas of the Site for a period of 8 hours per day 250 days per year (5 days per week for 50 weeks per year). There is the potential that the commercial worker could go back to a different area of the Site after work hours, or on the weekends, or during vacation time, however, any area where any recreational activities could occur, the most sensitive receptor (i.e., resident) has been evaluated, with the exception of Waterfront Plaza and Commercial Area 4.

There are also other potential combinations, including a utility worker and a construction worker as recreational visitors; however these combinations are not expected to change the results of the HHRA due to the low exposure frequency/duration for these receptors.

Therefore, evaluating specific individuals as members of more than one receptor group was not conducted in the HHRA. It is recognized that this represents a form of uncertainty; however, based on the discussion above, this form of uncertainty is deemed overly conservative and is



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not expected to change the outcome of the HHRA. The uncertainty section of the HHRA (Section 8.1.6) has been revised to include this discussion.

#### **U.S. EPA General Comment #6**

*The HHRA apparently assumes that all chromium is present as trivalent chromium. The HHRA should be revised to justify and document this assumption, including discussion of any species-specific sampling results from the Site. If the assumption that all chromium at the Site is present as trivalent chromium cannot be adequately justified (ideally by consideration of site-specific speciation data), revision of the HHRA will be necessary under the assumption that all or part of the chromium at the Site is present as hexavalent chromium.*

#### **Response**

All soil and groundwater analysis was conducted for total chromium. For soil, screening values are available for trivalent chromium and hexavalent chromium, but not total chromium. Therefore, concentrations of trivalent chromium and hexavalent chromium were calculated for each data point using measured total chromium concentrations and the recommended ratio of 1:6 hexavalent chromium to trivalent chromium, as per U.S. EPA Regional Screening Levels User's Guide, November 2011. Based on this analysis trivalent chromium and hexavalent chromium were not identified as COPCs for soil in any of the redevelopment areas. For groundwater, the screening value is available for total chromium, which incorporates toxicity associated with trivalent and hexavalent chromium. Total chromium was identified as a groundwater COPC for several of the areas. Available toxicity information for chromium is presented for trivalent chromium and hexavalent chromium and not total chromium. Given that only total chromium was measured in groundwater samples collected within the various areas, concentrations of trivalent chromium and hexavalent chromium were calculated for each data point using measured total chromium concentrations and the recommended ratio of 1:6 hexavalent chromium to trivalent chromium, as per U.S. EPA Regional Screening Levels User's Guide, November 2011. EPCs were determined from these calculated trivalent chromium and hexavalent chromium data points, which allowed for the calculation of risks/hazards for both chromium species.

It is recognized that there is a degree of uncertainty with respect to using a ratio of 1:6 for determining trivalent chromium and hexavalent chromium from total chromium analysis and this has been noted in the uncertainty section of the HHRA.



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**U.S. EPA General Comment #7**

*The HHRA presents summary statistics for both total and dissolved groundwater results. The HHRA should be revised to clarify that all potential exposures were evaluated using total groundwater concentrations. The HHRA should also be revised to clarify if and how dissolved groundwater data were used in the HHRA.*

**Response**

Total and dissolved groundwater results were screened separately to ensure that all metal COCs were carried forward in the HHRA. However, all potential exposures were evaluated using only total groundwater concentrations as indicated in Section 8.1.2.3. It should be noted that this approach represents a conservative approach because locations where total and dissolved groundwater data exist from the RI are Vertical Aquifer Profiling locations. Therefore, total data from these locations represent groundwater grab samples that were collected through the drilling augers and not in a properly screened and purged monitoring well.

**U.S. EPA General Comment #8**

*The HHRA does not consistently provide citations and full references for sources referred to in the text. For example, on page 161, "MDEQ's RRD Operational Memorandum No. 2 Frequently Asked Questions, February 2005" is mentioned without a reference citation. All sources/references mentioned in the text should be accompanied by a reference citation so the reader can readily identify and locate the correct source/reference.*

**Response**

The HHRA has been reviewed and revised as necessary to provide citations and full references to all sources and documents referred to in the HHRA text.

**U.S. EPA General Comment #9**

*Several acronyms and abbreviations (A&A)-including %, OSWER, and PPRTV-were not defined at first appearance in the text. The HHRA should be revised to define all A&A at first use. The A&A list should include all A&A defined in the text.*



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### **Response**

The HHRA has been reviewed and revised as necessary to define all acronyms and abbreviations at first appearance in the HHRA text.

The List of Acronyms and Abbreviations presented in the front end material of the RI Report has been reviewed and revised as necessary to include all acronyms and abbreviations that were presented in the HHRA text.

### **U.S. EPA Specific Comment #1**

*Section 8.1.2.1, Page 157, Paragraph 1. The in-text table at the top of page 157 shows all construction/utility work as occurring in the future. This seems particularly unlikely, especially in Area 2, currently used for light commercial and governmental activities. Current activity in Area 2 suggests that various utilities are active and may require servicing. Therefore, construction/utility activities for Area 2 should be described as current, as well as future. Section 8.1.2.1 should also be revised to clearly state whether any utilities are currently active in Areas 1 and 3 at the Site. If so, construction/utility activities should be described as current, as well as future, for these areas as well.*

### **Response**

Given that utilities are active in all areas of the Site, the HHRA was revised to include the evaluation of a current utility worker in all areas of the Site (the future scenario was also retained). It should also be noted that the HHRA was revised to evaluate the construction worker and utility worker separately in response to U.S. EPA Specific Comment #13.

### **U.S. EPA Specific Comment #2**

*Section 8.1.2.2, Page 158, Paragraph 1. Section 8.1.2.2 discusses the characteristics of the various human receptors considered in the HHRA. The commercial worker is described in terms of future conditions. However, at least a limited amount of commercial work is currently occurring in Area 2. Section 8.1.2.2 and the remainder of the HHRA should be revised to accurately report and incorporate all current and potential future land uses at the site.*

### **Response**

Based on current information, the only area of the Site that is currently being utilized for commercial purposes is Commercial Area 4. Therefore, the HHRA has been revised to include



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a current commercial worker exposure to surface soil and indoor air (from soil and groundwater) within Commercial Area 4. In addition, the former Sludge Dewatering Building located within Commercial Area 2 is currently under renovation and will become the City of Plainwell's Public Safety Building later this year. Therefore, the HHRA has been revised to include a current construction worker (in addition to the current utility worker described in the response to U.S. EPA Specific Comment #1) exposure to soil and groundwater within Commercial Area 2. These are the only areas that are currently occupied.

#### U.S. EPA Specific Comment #3

*Section 8.1.2.3, Page 159, Paragraph 1. Section 8.1.2.3 presents the selection of chemicals of potential concern (COPC). The text discusses the Michigan Department of Environmental Quality (MDEQ) Part 201 Cleanup Criteria, Part 213 Risk-Based Screening Levels, and the MDEQ Operational Memoranda for the Remediation and Redevelopment Division. However, no citations are provided for these sources. Without references, the reader may not be able to readily locate the sources with assurance that the reader will have found the same sources referred to in the text. Section 8.1.2.3 should be revised to provide citations for all sources and references referred to in the text.*

#### Response

This comment has been addressed in the response to U.S. EPA General Comment #8.

#### U.S. EPA Specific Comment #4

*Section 8.1.2.3, Page 160, Paragraph 1. Subsurface soil is described as "all soils from greater than 1 foot bgs [below ground surface] to the maximum depth evaluated (18 feet bgs)." Exposure of human receptors to soil below a depth of 10 or 12 feet bgs is not expected. The HHRA should be revised to define subsurface soil as soil at depths exceeding the interval of 1 foot bgs to 10 or 12 feet bgs (depth chosen should be based on the depth intervals employed in the remedial investigation [RI]). A less preferred alternative would be to revise Section 8.1.2.3 to provide a compelling justification for including soil deeper than the typical range of human exposure as part of subsurface soil.*

#### Response

The HHRA has been revised to define subsurface soils as all soils from greater than 1 foot bgs to 10 feet bgs, given that human exposure to soils below a depth of 10 feet bgs is not expected. All screening tables, exposure point concentrations, risks/hazards were re-calculated.





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#### U.S. EPA Specific Comment #5

*Section 8.1.3.1.1, Page 163, Paragraph 2. Section 8.1.3.1.1 describes current land use at the Site. The text states that the Site is currently vacant except for some areas used by the City of Plainwell "for storage of various seasonal decorative supplies and presentation rooms, fire hose testing, and ambulance driver testing." However, during a site visit, it appeared that a portion of the main building at Area 2 was being used (at least on an occasional basis) as office space by various individuals, including consultants to the City of Plainwell. Section 8.1.3.1.1 should be revised to discuss any use of the main building at Area 2 as office space.*

#### Response

This comment has been addressed in the responses to U.S. EPA Specific Comments #1 and #2. A utility worker within all areas of the Site, a commercial worker within Commercial Area 4, and a construction worker within Commercial Area 2 have been identified as potential receptors that are currently utilizing the Site. Section 8.1.3.1.1 has been revised to include a discussion of all potential current uses of the Site.

#### U.S. EPA Specific Comment #6

*Section 8.1.3.1.1, Page 164, Paragraph 0. The text states that potential human receptors under current land use conditions are limited to "persons who may infrequently trespass on the Site." However, as noted in Specific Comments 2 and 7, it appears that at least some utilities at Area 2 are active, and portions of the main building at Area 2 are at least infrequently used for various commercial and governmental businesses. Therefore, utility workers and commercial/industrial workers should be added to the list of current receptors at Area 2 of the Site.*

#### Response

This comment has been addressed in the responses to U.S. EPA Specific Comments #1, #2, and #5.

#### U.S. EPA Specific Comment #7

*Section 8.1.3.2, Page 164, Paragraph 4. Section 8.1.3.2 discusses the potential exposure pathways evaluated in the HHRA. The discussion would be improved by citing the human health CSM in the text. Section 8.1.3.2 should be revised to include a citation to and discussion of the CSM. (Note: a citation to the CSM could come as early as Section 8.1.3.)*



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### Response

Section 8.1.3.2 has been revised to reference and discuss the human health CSM presented on Figure 8.2.

It should be noted that the human health CSM was first referenced in Section 8.1.2.1, HHRA Conceptual Site Model (CSM).

### U.S. EPA Specific Comment #8

*Section 8.1.3.2.1, Page 165, Paragraph 1. Section 8.1.3.2.1 presents and discusses the release mechanisms through which site contaminants may be released into and move throughout the environment. The second bullet presents the "Potential release of contaminants from contaminated surficial soil through contact with surface water." This item should be expanded and clarified to note that contaminants from contaminated surficial soil may be impacted by precipitation and subsequent erosion and runoff, not just "through contact with surface water."*

*Contaminants at the Site present in groundwater or that may subsequently reach groundwater may migrate toward and discharge into adjacent surface water. Therefore, the list of release mechanisms should be expanded to include groundwater-surface water interaction.*

### Response

The second bullet of Section 8.1.3.2.1 has been expanded in order to clarify that contaminants from contaminated surficial soil may be impacted by precipitation and subsequent erosion and runoff.

The first bullet in Section 8.1.3.2 has been expanded to identify potential groundwater discharge to surface water following the leaching of contaminants from soil to groundwater.

### U.S. EPA Specific Comment #9

*Section 8.1.3.2.1, Page 165, Paragraph 4. The first line of this paragraph states, "The majority of the Site is covered with asphalt and concrete pavement. ..." It should be noted that the asphalt and concrete pavement at the Site has not been well maintained. Numerous cracks are present across the Site. Section 8.1.3.2.1 should be revised to identify and explain the relative disrepair and the presence of numerous cracks in the asphalt and concrete pavement at the Site.*



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**Response**

This first line of paragraph 4 of Section 8.1.3.2.1 has been revised to indicate that the asphalt/concrete is generally in poor condition, and contains cracks and breaches characteristic of deterioration.

**U.S. EPA Specific Comment #10**

*Section 8.1.3.2.1, Page 166, Paragraph 2. The discussion identifies the potential for volatile soil contaminants to migrate to ambient and/or indoor air. Non-volatile soil contaminants can also be introduced into the ambient air as part of fugitive dust emissions. Section 8.1.3.2.1 should be revised to discuss fugitive dust emissions.*

**Response**

Section 8.1.3.2.1 has been revised to include an additional paragraph that identifies the potential for non-volatile contaminants to be released to ambient air as fugitive dust emissions.

**U.S. EPA Specific Comment #11**

*Section 8.1.3.2.2, Page 166, Paragraph 3. Section 8.1.3.2.2 discusses fate and transport in receiving media. The list of potential contaminant transport mechanisms at the Site does not include uptake of contaminants into homegrown produce. It is not unreasonable to assume that residential and recreational redevelopment (e.g., parks) may include individual or community gardens, which may include homegrown produce. Therefore, Section 8.1.3.2.2 and the HHRA as a whole should be revised to include consideration and evaluation of potential human exposure through ingestion of homegrown produce.*

**Response**

The residential areas of the Site will not be comprised of single family detached homes, where the possibility of residents ingesting homegrown produce would be a potential exposure pathway. Rather, condominiums are proposed for these residential areas. Moreover, in the unlikely event that an individual or community garden be constructed in the residential areas, it is unreasonable to assume that Site soils would be used to support these gardens as the soils are not suitable for this type of use and soil material would be brought to the Site to support this type of vegetation. Sections 8.1.2.2, 8.1.3.1.2, and 8.1.3.2.5 have been revised to include this information.



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Potential impacts to vegetation within recreational areas have been evaluated in the Ecological Risk Assessment (ERA) presented in Section 9.0 of the RI Report.

#### **U.S. EPA Specific Comment #12**

*Section 8.1.3.2.5, Pages 168 and 169, Paragraphs 5 and 0. Section 8.1.3.2.5 discusses the exposure scenarios and completed exposure pathways considered for the site. The text states, "Access to the Site is restricted by a perimeter fence thus it is unlikely that trespassers would actively frequent the Site." The perimeter fence is not topped by barbed wire and is not especially tall; therefore, it is a minimal barrier to accessing the Site. Also, signs of trespassing such as footprints have been observed at the Site. Finally, at least historically, squatters have been observed at some of the Site buildings. Section 8.1.3.2.5 should be revised to provide a more even-handed and complete discussion of the potential for and evidence of trespassing at the Site.*

#### **Response**

The following sentence within Section 8.1.3.2.5 has been deleted: "Access to the Site is restricted by a perimeter fence thus it is unlikely that trespassers would actively frequent the Site. However, a hypothetical Site trespasser exposure to Site media was evaluated in the HHRA."

#### **U.S. EPA Specific Comment #13**

*Section 8.1.3.1.2, Page 164, Paragraphs 2. Section 8.1.3.1.2 describes potential future land uses at the Site. The text describes future potential construction/utility worker exposures as "short-term." While construction activities may reasonably be assumed short-term (roughly 6 months to a year or less), utility work, particularly at a large and complicated redevelopment project as envisioned for the Site, may require long-term inspection and repair activities. Therefore, Section 8.1.3.1.2 and the remainder of the HHRA should be revised to describe and evaluate potential future (and current, see Specific Comments 2 and 7) utility work as possibly long-term (greater than 6 months to a year and possibly much longer).*

#### **Response**

The HHRA has been revised to evaluate a utility worker and construction worker separately. The construction worker was assumed to be at the Site for a period of 120 days per year for 1 year for RME and 60 days per year for 1 year for CT during construction activities. The utility worker was assumed to be at the Site for a period of 2 days per year for 25 years for RME and 1 day per year for 9 years for CT during the maintenance of utilities. As indicated in previous



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responses to U.S. EPA Comments above, a utility worker was evaluated under current and future scenarios within all areas of the Site.

#### **U.S. EPA Specific Comment #14**

*Section 8.1.3.3, Page 170, Paragraph 1. Section 8.1.3.3 lists the primary references used to prepare the HHRA. The list does not contain any references to Michigan-specific HHRA guidance, such as MDEQ's Part 201 Cleanup Criteria, Part 213 Risk-Based Screening Levels, and related Operational Memoranda. Section 8.1.3.3 should be revised to include primary state HHRA guidance documents and tools used in the HHRA.*

#### **Response**

Section 8.1.3.3 presents the list of references that were used for identifying exposure assumptions and calculations of exposure for the various receptors and exposure pathways. MDEQ's Part 201 Cleanup Criteria, Part 213 Risk-Based Screening Levels, and related Operational Memoranda were not used in the identification of exposure assumptions and calculation of exposure. Rather the original sources of the MDEQ exposure assumptions are referenced within Section 8.1.3.3, which were the U.S. EPA Risk Assessment Guidance for Superfund (RAGs) and other U.S. EPA supplemental risk assessment guidance documents.

#### **U.S. EPA Specific Comment #15**

*Section 8.1.3.3.2, Pages 177 and 178, Paragraphs 5 and 0. Section 8.1.3.3.2 presents the exposure scenario-specific assumptions used in the HHRA. The skin surface area used for the adolescent trespasser is reported as 3,900 square centimeters (cm<sup>2</sup>). Footnote 4 of the in-text table indicates that this is based on 25 percent of the 50 percentile total body surface area for an adolescent. No reference is presented for the use of a value of 25 percent to account for exposed skin. It should be noted that, based on EPA's RAGS Part E (EPA 2004), and assuming potential exposed skin consisting of the face, hands, forearms, lower legs and feet, a skin surface area of about 4,473 cm<sup>2</sup> was calculated. Section 8.1.3.3.2 should be revised to provide justification for the assumptions used to calculate a skin surface area of 3,900 cm<sup>2</sup>, or revise the HHRA to use a skin surface area of 4,473 cm<sup>2</sup> for the adolescent trespasser.*

#### **Response**

The HHRA has been revised to apply a skin surface area of 4,473 cm<sup>2</sup> for the adolescent trespasser, as referenced in U.S. EPA (2004, RAGS Part E), and assuming potential dermal exposure to the face, hands, forearms, lower legs, and feet.



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**U.S. EPA Specific Comment #16**

*Section 8.1.3.3.2, Pages 180 and 181, Paragraphs 3 and 0. The in-text table for the resident receptor uses footnotes 1 through 9 in the table, but lists footnotes 8 through 16 in the list of footnotes. The in-text table should be revised to list footnotes 1 through 8 in the list of footnotes.*

**Response**

The numbered footnotes for the embedded table presented for the resident within Section 8.1.3.3.2 has been revised to show footnotes 1 through 9.

**U.S. EPA Specific Comment #17**

*Section 8.1.3.4.1.2, Page 189, Item (i). Section 8.1.3.4.1.2 presents the exposure input parameter values used for the adult lead model. Item (i) indicates that the maximum lead concentrations in various media were used. In contrast, EPA guidance states that average lead concentrations should be used as input parameter values (EPA 2003, 2009a, 2009b). Section 8.1.3.4.1.2 and related adult lead model calculations should be revised accordingly.*

**Response**

Section 8.1.3.4.1.2 of the HHRA and related adult lead model calculations have been revised to apply the average lead concentration as the input for the adult lead model.

**U.S. EPA Specific Comment #18**

*Section 8.1.4, Page 192, Paragraph 2. Section 8.1.4 presents the toxicity assessment of the HHRA. The indicated paragraph lists the primary sources of toxicity values used in the HHRA. The text should be revised to present reference citations for each of the sources used in the HHRA.*

**Response**

This comment has been addressed in the response to U.S. EPA General Comment #8.



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#### **U.S. EPA Specific Comment #19**

*Section 8.1.5, Page 195, Paragraph 6. Section 8.1.5 presents the risk characterization portion of the HHRA. The last sentence of this paragraph lists the EPA guidance documents used to prepare the HHRA. The parenthetical list includes U.S. EPA 2001. Section 11 lists the references used in the HHRA. Section 11 includes EPA 2001a and 2001b. It appears that EPA 2001b is the correct human health reference cited on Page 195. Section 8.1.5 should be revised to list EPA 2001b.*

#### **Response**

The reference to U.S. EPA, 2001 in the last sentence of the paragraph within Section 8.1.5 of the HHRA has been revised to U. S. EPA, 2001b.

#### **U.S. EPA Specific Comment #20**

*Section 8.1.5.3, Page 198, Paragraph 1. Section 8.1.5.3 presents a summary of the receptor-specific risks quantified for each receptor. The in-text table reports the non-carcinogenic hazard under central tendency (CT) conditions for the future recreational user as 7.0E-00. This result is incorrect; the correct value is 7.0E-01. The in-text table should be revised accordingly.*

#### **Response**

There have been significant changes made to the HHRA in response to U.S. EPA comments. As a result the above comment is no longer applicable.

#### **U.S. EPA Specific Comment #21**

*Section 8.1.5.4, Pages 200 through 203. Section 8.1.5.4 presents a summary of receptor-specific risks. Summations are presented for a combination of exposure pathways that each receptor is reasonably expected to encounter. However, a specific individual may be a member of more than one receptor group. For example, a future resident may also be a recreational user. Similarly, current or future commercial/industrial workers may also be recreational users. The total risks faced by these receptors would be a summation of the receptor-specific risks. Acknowledging and accounting for possible double-counting is necessary. Revising Section 8.1.5.4 is important to identify and discuss (including quantitative summaries) the possibility of membership of individual receptors in more than one receptor group, and to present risk summaries for these multi-receptor individuals.*



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**Response**

This comment has been addressed in the response to U.S. EPA General Comment #5.

**U.S. EPA Specific Comment #22**

*Section 8.1.5.6, Page 205, Paragraph 1. Section 8.1.5.6 discusses COPC-specific risk and hazard contributions. The text indicates that the area-and receptor-specific summary tables present COPC-specific results that contribute approximately 95 percent of the overall cumulative risk for that receptor. The summary tables include at a minimum chemicals with risks  $\geq 1E-04$ . This approach is insufficient. It is not unreasonable to present 95 percent of the cumulative risk for each receptor. However, the summary tables should identify all COPCs associated with risks  $\geq 1E-06$  and hazards  $\geq 1$ . If a list of contributing chemicals of concern (COC) becomes too long, footnotes can be used to document those COCs contributing to the various overall cumulative risks and hazards.*

**Response**

Section 8.1.5.6 of the HHRA has been revised to include all COPCs with calculated risks greater than or equal to  $1E-06$  and calculated hazards greater than or equal to 1.

**U.S. EPA Specific Comment #23**

*Section 8.1.5.6, Page 205, Paragraph 3. The text discusses the possibility of collecting soil samples representative of local background soil concentrations. The text refers to "MDEQ Statewide Background Levels"; however, no reference citation is provided. Section 8.1.5.6 should be revised to include a reference citation for the "MDEQ Statewide Background Levels" referred to. The text should also specify which particular statewide background levels are referred to and were used in the HHRA; that is, the text should specify-by reference to a particular section, page, or table number-the area of the State and soil type selected for the statewide background values used in the HHRA.*

**Response**

Section 8.1.5.6 has been revised to provide the reference citation for the MDEQ Statewide Background Levels that are mentioned.





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**U.S. EPA Specific Comment #24**

*Section 10.1.3, Pages 248 through 252. Section 10.1.3 presents a summary of the HHRA. This section should be revised to incorporate any changes to the HHRA required by the general and specific comments.*

**Response**

Section 10.1.3 of the HHRA has been revised to incorporate the changes indicated in the responses to U.S. EPA comments provided above.

**U.S. EPA Specific Comment #25**

*Appendix I.1. Appendix I.1 presents the Area 1 human health risk assessment tables. Area 1 calculations were closely checked. The comments presented below may not all apply to Appendixes I.2 and I.3. However, the comments should be considered reasonable surrogates for the types of comments that would result from close checks of Area 2 and Area 3 human health risk assessment tables. Therefore, Appendixes I.2 and I.3 should be closely reviewed and revised accordingly.*

- a. *Table I.1.1 presents the selection of COPCs for surface soil at Area 1. The column titled "Screening Toxicity Value" presents the lowest of soil protective ambient air and direct contact screening criteria. Footnote 4 states that if the statewide default background level exceeds the selected criterion, the background level is selected as the screening criterion. The reader cannot readily identify the basis for each selected chemical-specific criterion. Table I.1.1 (and other similar tables) should be revised to provide the basis for each chemical-specific screening toxicity value.*
- b. *Table I.1.7 presents the exposure parameter values used for surface soil exposure to the adolescent trespasser. Footnote 5 presents chemical-specific absorption factors (ABS). The footnote presents values for volatile organic compounds (VOC) with vapor pressures less than and greater than benzene. However, footnote 5 does not provide an ABS value for benzene itself. Table I.1.7 (and other similar tables) should be revised to present an ABS value for benzene.*
- c. *Tables I.1.21 and I.1.22 present the exposure parameter values for groundwater household use for future residents, and calculation of the dermal groundwater parameter  $DA_{event}$ , respectively. The  $DA_{event}$  values in Table I.1.22 were calculated using the same equations as in Table I.1.21, except that two parameters - concentration of water ( $C_w$ ) and a conversion factor (CF) - were absent from the equations presented in Table I.1.21. Tables I.1.21 and I.1.22 (and other similar tables) should be revised in a*



*coordinated manner to ensure that the reader is aware that the  $DA_{event}$  values listed in Table I.1.22 must be multiplied by chemical-specific  $C_w$  values and a CF for use in the equations presented in Table I.1.21.*

*In Table I.1.21 (page 2 of 2), the reasonable maximum exposure (RME) and CT values for the parameter fraction time exposed - child (FT - child) are switched. Table I.1.21 should be revised accordingly.*

*In Table I.1.22, the last column header includes a "1" superscript. However, the table does not include any footnotes. Table I.1.22 (and other similar tables) should be revised by adding a footnote 1 corresponding to this apparent footnote or removing the apparent footnote.*

- d. *Table I.1.33.RME presents the cancer risks and noncarcinogenic hazards for the future commercial worker in Area 1 under RME conditions. The exposure medium is listed as surface soil. However, as described in the text, future conditions were evaluated only for a combination of surface soil and subsurface soil. Therefore, Table I.1.33.RME (and other similar tables for future scenarios) should be revised to present the exposure medium as surface and subsurface soil. (Note: as stated in General Comment 4, the HHRA should be revised to evaluate future exposures of all receptors other than utility and construction workers to surface soil only, as well as to the combination of surface and subsurface soil.)*
- e. *Table I.1.35.CT presents a summary of current trespasser risks and hazards under CT conditions. The documentation of results presented in this Table I.1.35.CT would be improved by including in this table references to tables presenting the exposure pathway-specific results summarized in this Table I.1.35.CT. Therefore, Table I.1.35.CT (and other related tables) should be revised accordingly.*
- f. *Table I.1.36.CT presents a summary of future trespasser risks and hazards under RME conditions. The non-carcinogenic hazard quotient for mercury through inhalation is presented as 2.64E-08; the correct value is 2.88E-05. Table I.1.36.CT should be revised accordingly. Similarly, the total noncarcinogenic hazard index through inhalation is presented as 1.73E-04; the correct value is 2.01E-04. Table I.1.36.CT should be revised accordingly.*
- g. *Table I.1.40.CT presents a summary of future construction/utility worker risks and hazards under CT conditions. The total non-carcinogenic hazard index through inhalation and dermal contact are reported as "NC" and 3.04E-02, respectively; the correct values are 2.03E-01 and 2.23E-02, respectively. Table I.1.40.CT should be revised accordingly.*



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- h. Table I.1.40.RME presents a summary of future construction/utility worker risks and hazards under RME conditions. The total carcinogenic risks through ingestion, inhalation, and dermal contact are presented as 2.48E-07, 3.14E-10, and 1.04E-07, respectively; the correct values are 3.06E-06, 4.38E-08, and 2.75E-07, respectively. Table I.1.40.RME should be revised accordingly. Similarly, the non-carcinogenic hazard indexes through ingestion, inhalation, and dermal contact are presented as 4.34E-01, "NC", and 1.82E-01, respectively; the correct values are 8.12E-01, 4.06E01, and 1.34E-01, respectively. Table I.1.40.RME should be revised accordingly.*

**Response**

- a. All screening tables presented in the HHRA have been revised to include the basis for the "Screening Toxicity Value".
- b. All applicable exposure assumption tables presented in the HHRA have been revised to present the ABS value for benzene.
- c. The HHRA was revised to ensure that the equations for calculating  $DA_{event}$  for dermal exposure to groundwater are the consistent between the tables presenting the exposure assumptions and those tables presenting the calculation of  $DA_{event}$ .

The HHRA was revised to ensure that the tables presenting the exposure assumptions identify the correct fraction time exposed for CT and RME scenarios for the child and adult. It should be noted that this was only a typographical error and that the calculation of the exposure was correct in the HHRA.

The HHRA was revised to remove the superscript (1) from the last column header in all tables where calculation of the  $DA_{event}$  was presented.

- d. "Exposure Medium" in these tables refer to the point of contact for each receptor. For example, a commercial worker is assumed to conduct activities at or near the surface, and therefore, would only be exposed to surface soil. Therefore the exposure medium is surface soil. "Medium" in these tables refer to the actual medium that is used to calculation exposure. In the case of the future commercial worker, the medium is identified as soil (combined surface and subsurface). As indicated in the response to U.S. EPA General Comment #4, the HHRA was revised to evaluate future exposure to surface soil only for all receptors, except utility and construction workers, as well as the combined surface and subsurface soil.



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- e. The HHRA has been revised to include table references to tables presenting the exposure pathway-specific risks and hazards within all tables that summarize the risks and hazards for each receptor.
- f. There have been significant changes made to the HHRA in response to U.S. EPA comments. As a result this comment is no longer valid.
- g. This comment is addressed in the response to U.S. EPA Specific Comment #25f.
- h. This comment is addressed in the response to U.S. EPA Specific Comment #25f.

**U.S. EPA Specific Comment #26**

*Appendix I.4. Appendix I.4 presents the indoor air modeling for the HHRA. The appendix states that site-specific soil gas attenuation factors for the soil to the indoor air pathway were calculated through application of EPA's Johnson & Ettinger Excel spreadsheet model "SL-ADV-Feb04.xls". Appendix I.4 should be revised to include the model spreadsheets documenting the calculated attenuation factors.*

**Response**

Appendix I.12 (previously Appendix I.4) of the HHRA has been revised to provide the U.S. EPA's Johnson & Ettinger (J&E) Excel spreadsheets.

**SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT**

**U.S. EPA General Comment #1**

*The SLERA generally follows the approved work plan and relevant EPA ecological risk assessment guidance. Several issues must be addressed before the risk assessment can be approved, and these are described in the specific comments.*

**Response**

The comment is acknowledged. Please refer to the responses to the specific comments for details on how the comments have been addressed in the revised RI Report.



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#### U.S. EPA General Comment #2

*The SLERA section provides screening quotients (SQ) for a number of receptors and exposure pathways; however, SQs are not provided consistently throughout this section. It would benefit the reader to provide a summary table that highlights by area the significant risks (SQ greater than 1) by receptor and chemicals of potential ecological concern (COPEC). This would help focus the risk management discussion.*

#### Response

The text has been revised to identify screening quotients (SQ) for all constituents with Ecological Screening Values (ESVs). Additionally, a summary table (Table J.19) has been added to identify the SQs for all COPECs identified by each redevelopment area. For the screening assessment, SQs are not calculated for specific receptor groups. The Step 3a refinement process will consider specific receptors.

#### U.S. EPA Specific Comment #1

*Section 9.1.5, Page 220, Paragraph 3. The text states that the only medium considered in the SLERA is soil. However, the work plan states the following: "Although ecological receptors are not generally directly exposed to undiluted groundwater, aquatic organisms will be exposed to groundwater once it discharges to nearby surface waters. Thus, complete exposure pathways currently exist from groundwater to various aquatic biota. Moreover, if the chemicals bioaccumulate readily, semi-aquatic predators of the aquatic biota could be secondarily exposed via the food chain. These exposure pathways will be considered in the ERA." Either explain why the groundwater pathway was not evaluated, or evaluate the groundwater exposure pathways.*

#### Response

Soil is the only medium evaluated in the SLERA. Groundwater has not been observed discharging to the surface within the assessment area for the SLERA. Consequently, exposure of ecological receptors to groundwater is not a complete pathway. The Baseline Ecological Risk Assessment (BERA)(Camp, Dresser & McKee, 2003) for the Kalamazoo River addressed potential risk to semi-aquatic wildlife. The revised SLERA provides justification for not evaluating risk to semi-aquatic wildlife.



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**U.S. EPA Specific Comment #2**

*Section 9.1.5, Page 220, Paragraph 3, Bullet 1, and Figure 9.1. The surface soil exposure routes for direct contact and absorption to soil invertebrates--discussed in Section 9.1.5 on Page 220--are not represented on the figure. The figure must be revised to add this exposure pathway and these receptors.*

**Response**

Exposure routes for direct contact and absorption for soil invertebrates have been added to the CSM.

**U.S. EPA Specific Comment #3**

*Section 9.1.5, Page 221, Paragraph 1. "Texas Commission of Environmental Quality (TCEQ) 2006" is not included in the references. A reference appears to a Texas Natural Resource Conservation Commission document with the same date. The reference must be reviewed and the appropriate changes made in the report.*

**Response**

The name of the Texas Natural Resource Conservation Commission (TNRCC) was changed to the Texas Commission on Environmental Quality (TCEQ). Citations and references have been standardized to reference only the TCEQ.

**U.S. EPA Specific Comment #4**

*Section 9.1.7.2, Page 224, Paragraph 1. The EPA Region 4 soil screening benchmark documentation is listed in the text as "EPA 2001," while in the reference section it is listed as "EPA 2001a." The text must be revised to be consistent with the reference section*

**Response**

The reference to EPA 2001 in the text has been revised to EPA 2001a to be consistent with the references section.



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**U.S. EPA Specific Comment #5**

*Section 9.2.1, Page 224, Paragraph 2. The third sentence references Section 9.2.5, but this section does not exist. Revise the reference to specify Section 9.1.5.*

**Response**

Revisions to the SLERA have eliminated the references to Section 9.2.5.

**U.S. EPA Specific Comment #6**

*Section 9.2.2.1, Page 227, Paragraph 3. The second sentence states 11 metals are carried forward as COPECs; however, 12 metals actually are carried forward. The text must be corrected accordingly.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #7**

*Section 9.2.2.1, Page 227, Paragraph 5. The paragraph states that calcium, magnesium, potassium, and sodium are not carried forward as COPECS, but Table J.5 contradicts this statement and identifies potassium as a COPEC. Table J.5 must be revised or a footnote added providing justification for not carrying forward the metals.*

**Response**

The four metals that are essential nutrients (calcium, magnesium, potassium, and sodium) are eliminated as COPECs in the screening process. The text and tables have been revised to make this clear to the reader.

**U.S. EPA Specific Comment #8**

*Section 9.2.2.1, Page 228, Paragraph 4. The paragraph states 98 percent of the samples analyzed for n-nitrosodiphenylamine had a limit of detection (LOD) for that analyte below its Ecological Screening Value (ESV). However, this is in error-n-nitrosodi-n-propylamine should be specified instead of n-nitrosodiphenylamine. The text must be corrected accordingly.*



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**Response**

The error has been corrected in the revised text and tables.

**U.S. EPA Specific Comment #9**

*Section 9.2.2.1, Page 229, Paragraph 1. The paragraph lists three VOCs not detected in surface soil and lacking ESVs. This list includes 1,2-dibromo-3-chloropropane, while Table J.7 lists 1,2-dibromoethane. The text or table must be revised to be consistent.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #10**

*Section 9.2.2.2, Page 232, Paragraph 2. The text identifies the constituent 2,4-dimethylphenol twice, and 2,4-dinitrophenol is not included-inconsistent with the information in Table J.9. Moreover, 2,4-dinitro-2-methylphenol is also included in the list, but 4,6-dinitro-2-methylphenol is listed in Table J.9. The text must be revised to be consistent with Table J.9.*

**Response**

This error has been corrected in the revised text and tables.

**U.S. EPA Specific Comment #11**

*Section 9.2.2.2, Page 232, Paragraph 3. Ninety-four percent of the samples analyzed for n-nitrosodi-n-propylamine had a LOD for that analyte below its ESV. This COPEC must be added to the paragraph.*

**Response**

This error has been corrected in the revised text and tables.





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**U.S. EPA Specific Comment #12**

*Section 9.2.2.2, Page 233, Paragraph 1. The paragraph lists three VOCs not detected in surface soil and lacking ESVs. This list in the text includes 1,2-dibromo-3-chloropropane, while Table J.10 lists 1,2-dibromoethane and does not include 1,2-dibromo-3-chloropropane. The text or table must be revised to be consistent.*

**Response**

This error has been corrected in the revised text and tables.

**U.S. EPA Specific Comment #13**

*Section 9.2.2.3, Page 233, Paragraph 3. 1,1,2,2-tetrachloroethane is listed in the last sentence as not carried forward as a COPEC because it has an SQ of less than one. However, it is not included in Table J.11 as having been detected in surface soil within Area 3. The text or table must be revised to be consistent.*

**Response**

This error has been corrected in the revised text and tables.

**U.S. EPA Specific Comment #14**

*Section 9.2.2.3, Page 235, Paragraph 1. According to Table J.11, Aroclor 1260 (9 out of 54) was the most frequently detected Aroclor, not Aroclor 1254 (7 out of 54). The text must be revised to be consistent with the information in the table.*

**Response**

This error has been corrected in the revised text and tables.

**U.S. EPA Specific Comment #15**

*Section 9.2.2.2 and Section 9.2.2.3. Table J.5 identifies potassium as a COPEC; however, potassium is not discussed in either section, and is not included in any tables corresponding to Section 9.2.2.2. The text or table must be revised to be consistent.*



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**Response**

The four metals that are essential nutrients (calcium, magnesium, potassium, and sodium) are eliminated as COPECs in the screening process. The text and tables have been revised to make this clear to the reader

**U.S. EPA Specific Comment #16**

*Section 9.2.3.1, Page 237, Paragraph 4. The introduction should identify to the reader the location of the table used to support the statements in the text. The text should refer the reader to the supporting table - Table J.14.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #17**

*Section 9.2.3.2, Page 239, Paragraph 1. Aroclor 1016, Aroclor 1221, Aroclor 1232, and Aroclor 1242 are included in the text as carried forward in the risk assessment process to Step 3; however, these are not listed in Table J.14. The document must be revised to render the text and table consistent.*

**Response**

This error has been corrected in the revised text and tables.

**U.S. EPA Specific Comment #18**

*Section 9.2.3.2, Page 239, Paragraph 2. The SQ values listed in the text for lead and manganese (7.7 and 6.9, respectively) are not consistent with Table J.14 for the post-development dataset. The document must be revised to render the text and table consistent.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.



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**U.S. EPA Specific Comment #19**

*Section 9.2.3.4, Page 239, Paragraph 4. The introduction should identify to the reader the location of the table used to support the statements made in the text. The text should refer the reader to the supporting table - Table J.15.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #20**

*Section 9.2.3.4, Page 239, Paragraph 4. The paragraph states that under current conditions, only three VOCs were carried forward as COPECs. According to Table J.11, nine VOCs were carried forward as COPECs. The text should discuss all COPECs and provide justification as to why they were not carried forward for the either the current conditions or post-development conditions.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable; however, tables that provide the screening summary for the entire site and the individual development areas have been revised to identify the rationale for retaining or eliminating a constituent as a COPEC.

**U.S. EPA Specific Comment #21**

*Section 9.2.3.4, Page 240, Paragraph 4. The paragraph states that the SQ for high molecular weight (HMW) PAHs for the post-development is the same as the SQ for current Site conditions - both at 7.5. However, according to Table J.11, for current conditions, the SQ is 57; and according to Table J.15, for post-development conditions, the SQ is 54. The text must be revised to reflect the actual values.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.



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**U.S. EPA Specific Comment #22**

*Section 9.2.3.4, Page 240, Paragraph 5. According to Tables J.11 and Tables J.15, all three Aroclor species and total PCBs SQ values are the same for current conditions and post-development conditions. The text should be revised to be consistent with the table. Also, Aroclor 1016, Aroclor 1221, Aroclor 1232, and Aroclor 1242 are included in the text as carried forward to Step 3 in the risk assessment process; however, these are not included in Table J.15. The document must be revised to render the text and table consistent.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #23**

*Section 10.1.4, Page 253, Paragraph 2. The paragraph refers to Table J.14, which is incorrect. The reference should be to Table J.16. The text must be revised to correct this error.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #24**

*Section 10.1.4, Page 253, Paragraph 4. This paragraph refers to Figure 9.2; however, Figure 9.2 does not exist. The text must be revised to address this issue.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #25**

*Section 10.1.4, Page 254, Paragraph 0. The first sentence states "Two SVOCs (cymene and isopropylbenzene)...", it should say "Two VOCs (cymene and isopropylbenzene)..." Also, Figure*



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*9.2 is referred to in the paragraph; however, Figure 9.2 does not exist. The text must be revised to address this issue.*

**Response**

Evaluation of 11 redevelopment areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**U.S. EPA Specific Comment #26**

*Table J.4. The ESV source for chromium is incorrectly listed as the Ecological Soil Screening Levels (ECO-SSL) Mammalian value. The ESV is actually the ECO-SSL Avian value for chromium III. The table must be revised to address this issue.*

**Response**

This error has been corrected in Table J.4.

**U.S. EPA Specific Comment #27**

*Table J.4, Page 1. The constituent 1,2-dibromo-3-chloropropane is listed twice in the table, and the second listing is accompanied by the incorrect ESV. The table must be revised to address this issue.*

**Response**

This error has been corrected in Table J.4.

**U.S. EPA Specific Comment #28**

*Table J.4, Page 1. The table does not provide an ESV for 1,2-dibromoethane, while it is listed in the EPA R5 Ecological Screening Level (ESL) source with an ESV as 1,230 micrograms per kilogram ( $\mu\text{g/kg}$ ). The table must be revised to address this issue.*

**Response**

This error has been corrected in Table J.4.



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**U.S. EPA Specific Comment #29**

*Table J.4, Page 1. The source Dutch Intervention is used as the source for the ESV for methyl tertiary butyl ether (MTBE), and this source is not listed in the tiered approach in Section 9.1.7.2. The text must be revised to add this source to the tiered approach or provide further justification as to why this source was used.*

**Response**

The Dutch Intervention value and its reference have been added to the text.

**U.S. EPA Specific Comment #30**

*Table J.4, Page 2. An ESV is reported by the EPA R5 ESL source for 1,2,4,5-tetrachlorobenzene as 2,020 µg/kg. This ESV should be used, and the table and text should be revised to include it.*

**Response**

This error has been corrected in Table J.4 and the text.

**U.S. EPA Specific Comment #31**

*Table J.4, Page 3. The ESV for 4-methylphenol provided in the table is incorrect. The ESV for m-cresol was used, and the ESV for p-cresol (4-methylphenol) - 163,000 µg/kg - should have been used. The table and all corresponding locations throughout the document should be revised to specify the correct ESV for 4-methylphenol.*

**Response**

This error has been corrected in Table J.4 and the text.

**U.S. EPA Specific Comment #32**

*Table J.4, Page 3. The constituent n-nitrosodi-n-propylamine is repeated in the table, but is specified incorrectly in the first instance as n-nitroso-di-n-propylamine. The table must be revised accordingly.*



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**Response**

This error has been corrected in Table J.4.

**U.S. EPA Specific Comment #33**

*Table J.4, Page 3. The ESV for 3-methylphenol listed in the table is incorrect. The ESV for p-cresol was used, and the ESV for m-cresol (3-methylphenol) - 3,490 µg/kg-should have been used. The table and all corresponding locations throughout the document should be revised to specify the correct ESV for 3-methylphenol.*

**Response**

3-methylphenol was not an analyte for any of the samples. Reference to 3-methylphenol has been deleted from Table J.4.

**U.S. EPA Specific Comment #34**

*Table J.4. According to Section 9.1.7.2, the ESVs were taken from sources in a tiered approach, with the Tier I source as EPA ECO-Soil Screening Levels (SSL), Tier II as EPA Region 5 ESLs, and Tier III as the lowest value among: Oak Ridge National Laboratory (ORNL) ecological screening benchmarks for soil and litter invertebrates, ORNL ecological screening benchmarks for terrestrial plants, or EPA Region 4 soil screening benchmarks. The following constituents' ESV values were reported from sources in Tier III, even though ESV values are available from the Tier II source:*

- Toluene
- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol
- Diethylphthalate
- Di-n-butylphthalate
- Hexachlorocyclopentadiene
- Nitrobenzene
- N-Nitrosodiphenylamine

*Justification should be provided for this deviation from the protocol, or the table should be revised along with all corresponding locations throughout the document.*



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**Response**

The Tier II values identified in this comment were used as the ESVs in the revised SLERA. The tables and text and have been revised accordingly.

**U.S. EPA Specific Comment #35**

**Table J.4. Notes.** *The references for ORNL Invertebrates, ORNL Microbes, and ORNL Plants need attached letters to distinguish between the two documents.*

**Response**

Notes have been added to Table J.4 to distinguish between the two ORNL documents.

**U.S. EPA Specific Comment #36**

**Table J.4 Notes.** *The references listed for EPA R4 and EPA R5 ESLs are not consistent with the citations provided in the references section, Section 11. The table must be revised to be consistent with the text.*

**Response**

The citations and references for EPA R4 and EPA R5 ESLs have been revised to be consistent.

**U.S. EPA Specific Comment #37**

**Table J.5.** *The sum of LMW PAHs maximum concentrations does not equal 3611; it equals 3790. The table must be corrected.*

**Response**

Evaluation of 11 development areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable. However, it should be noted that maximum concentrations for low molecular weight (LMW) polycyclic aromatic hydrocarbons (PAHs), heavy molecular weight (HMW) PAHs, and total PCBs are based on maximum concentrations for individual PAHs and Aroclors. The maximum concentrations for the individual PAHs and Aroclors are not necessarily from the same sample. Consequently, summing the maximum concentrations may not produce the same concentration as the





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maximum concentration for LMW PAHs, HMW PAHs, or total PCBs, which is based on the individual samples with the highest concentrations.

**U.S. EPA Specific Comment #38**

***Table J.5. The sum of HMW PAHs maximum concentrations does not equal 8250; it equals 8610. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.

**U.S. EPA Specific Comment #39**

***Table J.5. The Total PCBs maximum concentration total does not equal 1190; it equals 1242. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.

**U.S. EPA Specific Comment #40**

***Table J.8. The sum of LMW PAHs maximum concentrations does not equal 25560; it equals 32000. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.

**U.S. EPA Specific Comment #41**

***Table J.8. The sum of HMW PAHs maximum concentrations does not equal 55800; it equals 57300. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.



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**U.S. EPA Specific Comment #42**

***Table J.8. The Total PCBs maximum concentration total does not equal 11000; it equals 11460. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.

**U.S. EPA Specific Comment #43**

***Table J.11. The sum of LMW PAHs maximum concentrations does not equal 86650; it equals 98150. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.

**U.S. EPA Specific Comment #44**

***Table J.11. The sum of HMW PAHs maximum concentrations does not equal 63000; it equals 90300. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.

**U.S. EPA Specific Comment #45**

***Table J.11. The Total PCBs maximum concentration total does not equal 400; it equals 510. The table must be corrected.***

**Response**

Please see response to Specific Comment No. 37.



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**U.S. EPA Specific Comment #46**

**Table J.14.** *The SQ value for vanadium is missing from the table. The table must be corrected.*

**Response**

Evaluation of 11 development areas rather than the three areas in the original SLERA has resulted in this comment no longer being applicable.

**NOVEMBER 9, 2011 MEMORANDUM REGARDING HHRA AND SLERA**

**U.S. EPA HHRA Comment #1**

*The memorandum of November 9, 2011, states that the 95 percent upper confidence limit (UCL) of the mean will be calculated for each chemical of potential concern (COPC) using EPA's ProUCL software (Version 4.1), and will be used as the exposure point concentration (EPC) for surface soil and soil under both reasonable maximum exposure (RME) and central tendency exposure (CTE) conditions. The proposed approach is largely correct as presented. However, as discussed in EPA guidance (EPA 2010), in some cases the 95 UCL may not be appropriate as the EPC (for example, if the 95 UCL exceeds the maximum detected concentration). Therefore, the HHRA should be revised to calculate EPCs as per EPA guidance (e.g., 95 UCL) (EPA 2010). As stated in the memorandum, the same EPC should be used for both RME and CTE conditions.*

**Response**

The HHRA applied calculated EPCs consistent with methodology presented in U.S. EPA 2010. The same EPC were applied for the CT and RME scenarios.

**U.S. EPA HHRA Comment #2**

*In some cases, as shown on Figure 1 of the memorandum, the conceptual redevelopment plan, sampling points are located on or very near the border between two exposure areas. A primary example of this situation is a series of sampling points located along the eastern border between the Waterfront Plaza and Residential Area 4. It may be reasonable to include such points in the sample sets for multiple exposure areas. This approach would supplement the relatively small sample sizes in particular exposure areas. The HHRA should clearly state and justify its use of sample points located on or very near the border between two different exposure areas.*



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### **Response**

The data applied in the HHRA were primarily collected in areas of known contamination. Sampling rounds usually focused on additional characterization and delineation of the more heavily contaminated areas. These areas of high contamination have no relationship with the various development areas that were identified based on the conceptual redevelopment plan. Therefore, it is conceivable that certain development areas may have larger data sets compared to others.

All development areas of the Site had a sufficient number of soil samples (minimum sample size between 8 and 10 soil samples as identified by U.S. EPA, 2010), with the exception of Waterfront Plaza and Commercial Area 3. Based on the conceptual redevelopment plan, there was no soil data available for the Waterfront Plaza. Therefore, 5 surface soil samples and 12 surface and subsurface soil samples collected adjacent to Waterfront Plaza and within Residential Areas 3 and 4 were combined to form the Waterfront Plaza soil dataset to permit evaluation of soil exposure within this development area. Based on the conceptual redevelopment plan, there were 6 surface soil samples and 15 surface and subsurface soil samples available for Commercial Area 3. The number of surface soil samples for both Waterfront Plaza and Commercial Area 3 are less than the U.S. EPA (2010) recommended minimum sample size of 8 to 10 samples; however, given that the potentially contaminating activities within these development areas were very limited and investigated, and that the HHRA also included evaluation of all receptors to the combined surface and subsurface soils, which has a sufficient sample size, it is expected that the low sample size for surface soil at Waterfront Plaza and Commercial Area 3 would not be identified as a significant uncertainty in the datasets for these areas.

For groundwater, many of the development areas had sample sizes less than the U.S. EPA (2010) recommended minimum sample size of 8 to 10 samples. Therefore, to supplement relative small sample sizes in the development areas, the groundwater data for the Site was separated into three areas (Area 1, Area 2, and Area 3) consistent with the separation of the Site during the Site Characterization and that followed by the HHRA in the previous submission (see Figure 1.2 of the RI report). To determine which Area (Area 1, Area 2, or Area 3) each development area occurs, the conceptual redevelopment plan presented on Figure 8.1 of the RI Report was overlaid on Figure 1.2 of the RI report (some overlap occurred). For example, Residential Area 4 on Figure 8.1 of the RI Report is located within Area 1 on Figure 1.2 of the RI Report. Therefore, the groundwater dataset for Residential Area 4 would be the Area 1 groundwater dataset. The following bullets summarize the distribution of the groundwater datasets:

- Area 1 groundwater data was applied in Residential Areas 1, 2, and 3 and Commercial Area 1



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- Area 2 groundwater data was applied in Commercial Area 4 and Mixed Residential/Commercial Area 2
- Area 3 groundwater data was applied in Commercial Areas 2 and 3, Mixed Residential/Commercial Area 1, Residential Area 4, and Waterfront Plaza

#### **U.S. EPA HHRA Comment #3**

*Figure 1 includes a new exposure area called the "Waterfront Plaza." No description of this exposure area is provided in the memorandum. Therefore, it is not possible to clearly identify the receptors to be considered for this exposure area. The HHRA should clearly describe the anticipated conditions and use of the Waterfront Plaza, and the receptors that will be considered in the HHRA for this exposure area.*

#### **Response**

Section 8.1.2 of the HHRA has been revised to include a clear description of the use and receptors anticipated for Waterfront Plaza.

#### **U.S. EPA SLERA Comment #4**

*The memorandum of November 9, 2011, states that the 95 UCL of the mean will be calculated for each COPC using EPA's ProUCL software (Version 4.1), and will be used as the EPC. The proposed approach is largely correct as presented. However, as discussed in EPA guidance (EPA 2010), in some cases, the 95 UCL may not be appropriate as the EPC (for example, if the 95 UCL exceeds the maximum detected concentration). Therefore, the SLERA should be revised to calculate EPCs as per EPA guidance (e.g., 95 UCL) (EPA 2010).*

#### **Response**

Reasonable maximum exposure concentrations (RMEs) for the refinement of COPECs have been calculated per EPA guidance (2010) for use in the SLERA.

#### **U.S. EPA SLERA Comment #5**

*Page 3, Paragraph 3, Item 4. The text notes that only benchmark values above Michigan background levels will be used. It is not appropriate to use statewide values for this comparison. If site-specific background values are not available, county-specific values should be used. The*



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*following United States Geological Survey website provides county-specific values for a variety of metals: <http://tin.er.usgs.gov/geochem/doc/averages/countydata.htm>.*

**Response**

The reference identified in the comment will be consulted for values specific to Allegan County. If a county specific value is not available, values for Michigan identified in guidance for the ECO-SSLs (Table 2.3 of Guidance for Developing Soil Screening Levels, USEPA 2003) will be used.

**U.S. EPA SLERA Comment #6**

*Page 4, Item 6. The text notes that the total ingestion will be adjusted for seasonal and area use. To be consistent with EPA guidance, the representative receptors should be those present at the site for the entire year, and those that have a small use area so as to minimize any adjustments. Moreover, the most sensitive receptors should be selected - typically the smaller species within a receptor guild because these have a higher metabolism rate and a higher ingestion rate per body mass than do larger receptors.*

**Response**

The refinement process will consider seasonal and area use if the hazard quotient for an indicator species is greater than one. For the initial iteration, the indicator species will be assumed to be present year round and obtain all of their diet from a single redevelopment area. The indicator species selected will be based on body size and sensitivity.

**U.S. EPA SLERA Comment #7**

*Page 4, Paragraph 6. The text notes that both no observed adverse effect levels (NOAEL) and lowest observed adverse effect levels (LOAEL) will be used. Because the Ecological Soil Screening Levels (EcoSSL) are based on NOAELs, it is not clear what protocol will be followed to determine LOAEL-based toxicity values. Therefore, a technical memorandum describing the protocols to be followed or the sources for the values should be submitted to EPA for review and comment prior to use of those values.*

**Response**

The Technical Memorandum requested in this comment is being submitted concurrently with the revised RI Report and is attached to this response to comment document.



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Should you have any questions with regard to this letter, please do not hesitate to contact the undersigned.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Gregory A. Carli, P. E.

GAC/JQ/ds/6/Plw.

Encl.

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